Gaymar
Your patients. Our commitment.

T/PUMP®

TP702 Localized Temperature Therapy System

Operator's Manual [EN]

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SYMBOLS USED WITHIN THIS MANUAL AND ON THE PRODUCT

	Warm Water Fill Line
	Cold Water Fill Line
	Attention, consult Operator's Manual.
	Water Levels
	Water Flow
	Dangerous Voltage
	Type BF Applied Part
	Do not penetrate with sharp object.
	Length of cycle time
	Continuous

BEFORE YOU BEGIN . . .

Read and understand this T/PUMP OPERATOR'S MANUAL and all SAFETY PRECAUTIONS (see page 3) prior to using the T/Pump.

Only qualified medical service personnel should repair or perform function tests on the T/Pump. Contact your dealer or Gaymar's Technical Service Department for assistance:

Telephone: 716 662-2551

RECEIVING INSPECTION

Check the shipping carton for damage immediately upon receipt. If package damage is discovered, the device should be unpacked with the carrier's agent present. Any claims for shortage or damage must be filed with the delivering carrier by the purchaser. Do not return pumps that were damaged in shipment to GAYMAR without contacting our Technical Service Department for advice (see phone numbers below). If damaged goods are returned to GAYMAR without notifying the carrier, GAYMAR will assume the repairs will be made at the customer's expense.

TO RETURN PUMPS TO FACTORY FOR REPAIR OR EXCHANGE

Merchandise returned to GAYMAR must be accompanied by a Return Goods Number (RG#), issued by GAYMAR, authorizing goods to be returned. Contact your local dealer or Gaymar's International Department at:

International: +1 716-662-8636
Fax: +1 716-662-0730

Provide the model, serial number, and detailed nature of the problem. You will be given a Return Goods Number (RG#).

The serial number can be found on the bottom of the T/Pump.

T/PUMP, T/PAD, Mul•T•Pad, Clik-Tite, and Gaymar are registered trademarks of Gaymar Industries, Inc. U. S. PATENT 4,068,870

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SAFETY PRECAUTIONS

⚠ DANGER

- Risk of explosion. Do not use in the presence of flammable anesthetics.
- Risk of electric shock. Disconnect power before servicing the

⚠ WARNING

- This device pumps temperature controlled water through a pad. Set the pad temperature only as directed by and under the guidance of the prescriber.
- Check the skin integrity of the body surface to which therapy is applied. Evaluate patient response to temperature application.
- Check patient's skin for adverse reactions every 30 minutes or as directed by the prescriber.
- Failure to adhere to these warnings could result in patient injury.
- The following Groups/Conditions require additional surveillance:

Group/Condition at risk	Potential Injury
Pediatric patients: The portion of an infant's skin surface in contact with a pad, in relationship to their body mass, can potentially affect their body temperature.	Hyperthermia/ Hypothermia
Patients with impaired circulation	Ischemia
Areas of application under pressure	Ischemia

- Only qualified medical service personnel should repair the T/Pump. Improper repair may result in death or serious injury, equipment damage, or malfunction.
- Use T/Pump TP702 controls with Mul•T•Pads. For catalog numbers and descriptions, see page 5.
- Do not place additional heat sources between the patient and pad. Skin damage may result.

⚠ CAUTION

- Federal law restricts this device to sale by or on the order of a physician.
- Do not cover the control unit with blankets, pillows or other insulating materials. Air flow is required to maintain system performance.

INTRODUCTION

Heat therapy is effective in the dilation of blood vessels, thereby increasing the blood flow to the heated area. Heat therapy has a variety of uses, the most common being treatment of aches and pains in joints and muscles.

Cooling therapy assists in vasoconstriction, decreasing blood flow and decreasing the metabolism in the affected area. Cooling therapy is applied in the acute phase of injury minimizing blood loss, inflammation of the tissue, and can be effective in pain management.

The GAYMAR T/Pump® Localized Temperature Therapy System provides therapy by warming or cooling the enclosed water, and circulating it through the Gaymar Mul•T•Pad. The pad is connected to the Gaymar T/Pump with easy-to-use Clik-Tite® connectors.

The Mul•T•Pad provides the interface for delivering the temperature therapy. The unique button design allows water to flow and provides trouble-free operation when the pad is folded to form a customized fit. This reduces the number of pads your facility must keep in inventory. The pads are applied to the part of the body requiring therapy, and the circulating water maintains the pad at the setpoint temperature. The setpoint temperature can be locked to prevent tampering.

Connecting the Pads

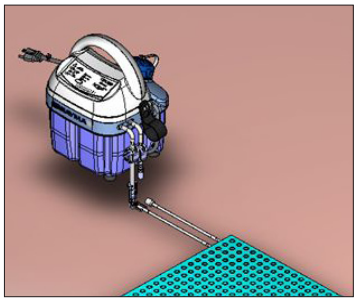


Figure 1A: Localized Temperature Therapy System with Single Pad with the TP702.

The Mul•T•Pads can be interconnected using Clik-Tite® connectors to provide therapy to more than one body site at a time.

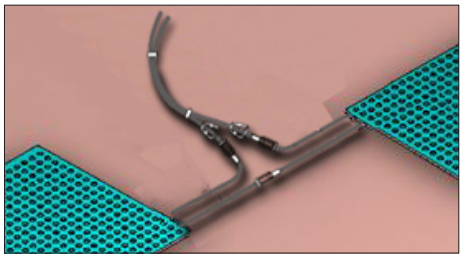


Figure 1B: Localized Temperature Therapy System with Multiple Pads.

Catalog Descriptions

Catalog #	Product Name
TP702	Professional Control Unit
TP22B	Mul•T•Pad: 15"w x 22"l (38cm x 56cm) All Polymer. 10 per carton
TP22C	Mul•T•Pad: 15"w x 22"l (38cm x 56cm) Nonwoven fabric on one side, pliable polymer on the other side. 1 per carton
TP3E	Mul•T•Pad: 3"w x 23"l (8cm x 58cm) Nonwoven fabric on one side, pliable polymer on the other side. 10 per carton
TP12E	Mul•T•Pad: 13"w x 18"l (33cm x 46cm) Nonwoven fabric on one side, pliable polymer on the other side. 20 per carton
TP22E	Mul•T•Pad: 15"w x 22"l (38cm x 56cm) Nonwoven fabric on one side, pliable polymer on the other side. 20 per carton
TP26E	Mul•T•Pad: 18"w x 26"l (46cm x 66cm) Nonwoven fabric on one side, pliable polymer on the other side. 10 per carton
TP22G	Mul•T•Pad: 15"w x 22"l (38cm x 56cm) Heavy Polymer, Reuseable. 10 per carton

To order any of these products contact your dealer or Gaymar's International Department at:

International: +1 716-662-8636

Fax: +1 716-662-0730

Or, visit our website at www.gaymar.com

INDICATIONS FOR USE

Localized temperature therapy is recommended in treating the following applications:

Orthopedic Conditions such as:

acute injuries, chronic pain, lower back pain, muscle spasm and strains

Skin Trauma such as:

abscesses, boils, bruises, burns and contusions

Cold Indications

muscle spasm
contusions
tendonitis
pain management

Other conditions such as:

chronic arthritis, neuritis, phlebitis, tendonitis and I.V. infiltration, infection and localized pain.

Other applications only as prescribed.

OK for Use With:

- Non-acute traumatized tissue.
- Impaired mental status.
- Insensate body surface.
- O_2 therapy. However, if oxygen tent is in use, do not use pump inside tent.

CLINICAL CONTRAINDICATIONS

Heating contraindications are:

- Application to a body surface with compromised blood flow (Ischemia, area under pressure, arterial insufficiency).
- Application to a patient with an increased tendency to bleeding (aggravates potential for hemorrhage).
- Application to a body surface with possibility of malignancy (tissue metabolism is increased and therefore, the growth potential of the malignant tissues).
- Treatment of hematoma within first 24-48 hours (potential for re-bleeding and hemorrhage).
- Recent sprain or fracture (acute inflammatory response).
- In combination with topical solutions whose toxicity may be affected by the application of heat.
- In combination with other heat sources.

Cooling contraindications are:

- Application to a body surface with compromised blood flow or hypersensitivity to cold. (Ischemia, Reynauds Syndrome).

PUMP FEATURES

Easy to Use Keypad	See KEYPAD FEATURES on page 8.
Attached hose	10 ft (305 cm) dual hose. Connectors allow pads to be connected to the pump (Figures 1A and 1B, page 4).
Flow indicator	Indicates no flow. Turns off heater if pump is tipped.
Warm/Cool Delivery	Four temperature setpoints on the TP702.
Therapy Cycles	Choose from 20-minute, 30-minute, or Continuous cycles.
On/Standby Button	Indicates power is supplied to the unit.
Over Temp Safety Thermostat	Limit thermostat shuts off pump and heater if the high temperature limit is exceeded.
Self Check	Automatic system check at startup.
Hose/cord Management	Convenient and easy storage areas for hose and cord.
Comfortable Handle Design	Designed for a more comfortable grip when moving the pump.
Dual Micro Processor	Two electronic circuits, one over temperature sensing circuit.
Tethered Easy-Open Cap	Prevents misplacing the cap. Only 1/4 of a turn is needed to remove or secure the cap.
Handle Vents	The vents in the handle allow air flow to keep the motor and heater inside the unit cool.

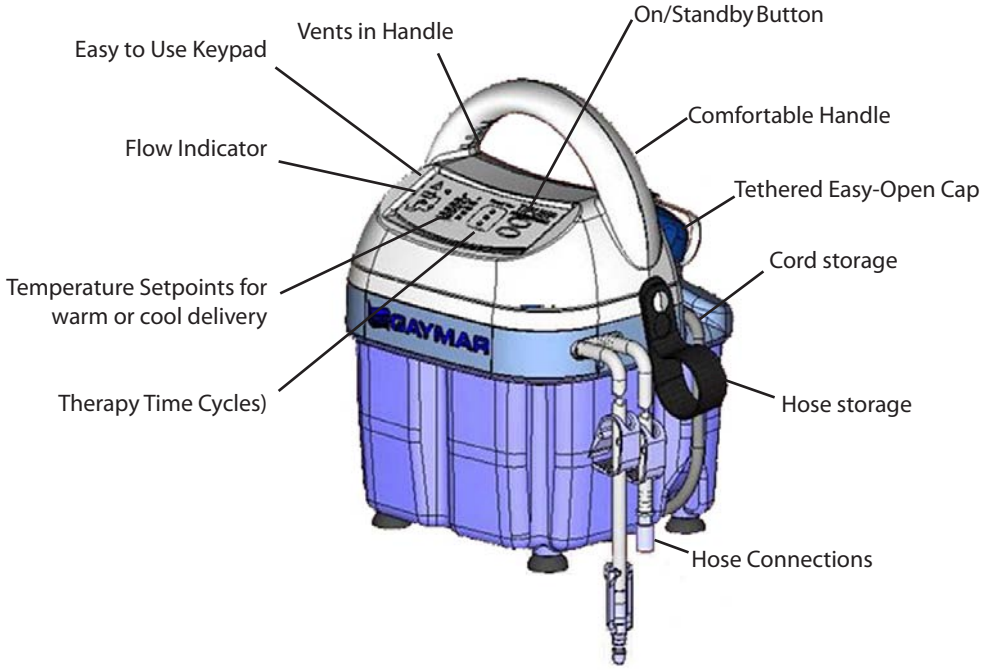


Figure 2: T/Pump Features

KEYPAD FEATURES
TP702

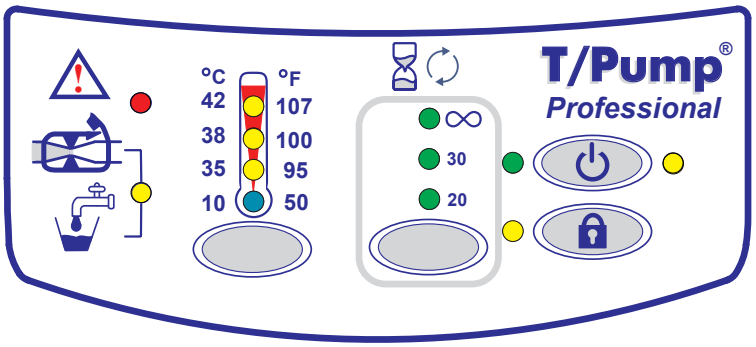
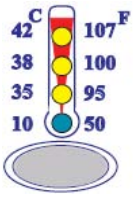
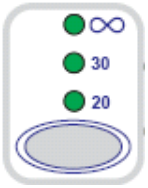


Figure 3: TP702 Keypad

Indicator/ Warning Light	See the Troubleshooting section on page 12.
	Water Flow Check hoses or clamps for kinks or occlusions.
	Water Level Check water level.
Setpoints	Press the button at the bottom of the setpoint indicator to toggle through the four setpoints. Temperatures are identified in °C and °F. 
Setpoint Lock	Prevents tampering. Press and hold for 2 seconds to lock or unlock the setpoint.
Therapy Cycles 	 Continuous cycle, 30-minute cycle 20-minute cycle.
	Green indicates the unit is on. Yellow indicates power is supplied to the unit but the unit is not on.

CLIK-TITE® CONNECTORS

Note: Refer to Figure 1B on page 4 when connecting multiple pads.

The TP702 T/Pump is supplied with Clik-Tite® connectors.

To connect and disconnect Clik-Tite® connectors from hose to pad:

1. Insert male fittings into female fittings with a twisting motion (Figures 4A and 4B).
2. When fittings are fully inserted, snap locking ring into place (Figures 4C and 4D).
3. To disconnect, reverse the procedure.
4. To open or close the hose pinch clamps:
   - Open the clamp by pushing the serrated end (Figure 5B).
   - Close the clamp by pressing the clamp together (Figure 5C).

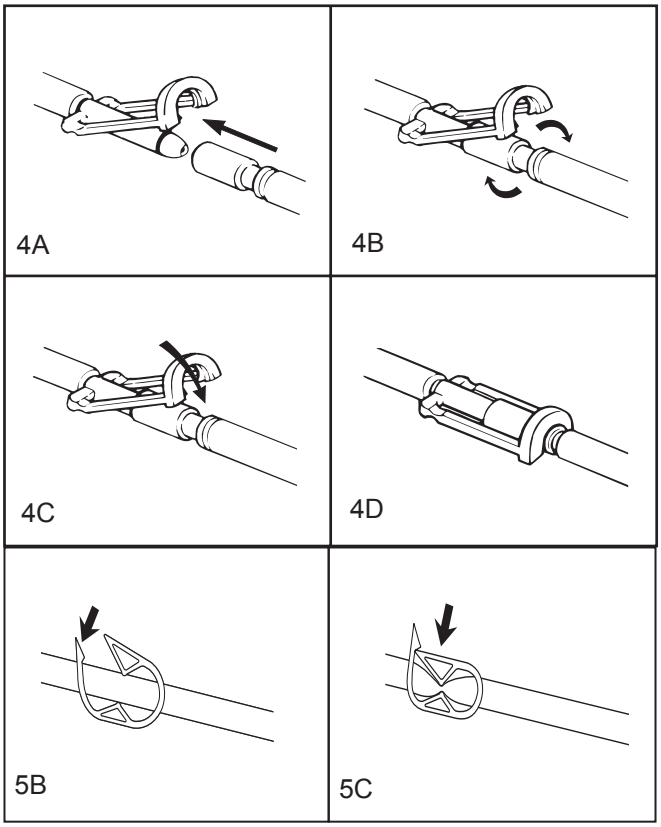


Figure 4: Clik-Tite® Connectors

START-UP PROCEDURE

1. Before filling the pump, always attach a pad to the connector hose or close the clamps on the connector hose ends. Make sure that there are no kinks in the hose or pad. Open the hose clamps.
2. Open the fill cap on top of the pump.
3. To fill for cooling:
   a. Fill with cold water to the Cooling water line.
   b. Fill with ice to the full capacity of the reservoir.

4. To fill for heating, fill with room temperature water to the Heating water line.

5. Plug the T/Pump into a properly grounded Hospital Grade receptacle.
6. Press the On/Standby button.

   The light next to the selected temperature begins to flash.
7. Use the keypad to set the temperature as directed by the prescriber. After setting the temperature, press and hold the lock Temperature Setpoint button for 2 seconds to lock the setpoint.

   Note: If you toggle past the desired setpoint, keep toggling to start at the beginning of the setpoint column.

   If warming, the selected water temperature will be reached in approximately 11 minutes and the light next to the selected temperature becomes steady.
8. Check the water level. If it drops below the operating level, add water.
9. Apply the Mul•T•Pad to the patient as prescribed. Follow the Mul•T•Pad instructions.
10. Position the pump at or above the level of the pad.

    Note: If the pump is placed below the pad(s), water will drain into the pump when it is shut off. If the pump has been overfilled or if multiple pads are connected, excess water can leak.

SHUTDOWN PROCEDURE

1. Press the On/Standby button so that the Standby light is lit.
2. Unplug the T/Pump.
3. Close all hose clamps.
4. Disconnect pad(s) from pump.
   To prevent water spillage, always disconnect pad from pump with connectors raised above the level of the pad and pump.
5. Coil the hose, and attach the Clik-Tite® connectors together on the hose (See Figure 4, Page 9), where applicable.
6. Secure the hose to the T/Pump using the tube set strap.
7. Wrap the power cord around the unit.

THERAPY CYCLES, PROFESSIONAL ONLY

Therapy Cycles:

1. Turn the unit on, and place it into 20 (or 30) minute therapy cycle. The unit will start to heat up. Select warming period for 20 (or 30) minute cycle, LED should be solid, and the selected temperature LED is flashing.
2. Once the T/Pump reaches the desired temperature, the Warming LED (Red) flashes with a short audible beep. This is to let the operator/user know the unit is at temperature and the timed therapy is starting. The warm-up period will take about 5 to 10 minutes depending on the selected Setpoint.
    a. Note: If this is not the first time the unit has cycled (the unit is already warmed up) the warm up period is about 2 minutes.
3. Once the 20 (or 30) minute period is up, the heater and pump shuts off. This stops any flow to the pad. The Setpoint and Therapy time LED's will be blinking during the off Time period. This is to inform the operator that the unit is not just in standby. During this time the pad temperature will slowly drop to the patients body temperature.
4. Once the Off Time period is up, the pump and heater will restart. The patient may feel a cooling in the pad due to the drop in temperature in the hoses. Time Therapy LED goes solid, and the Setpoint LED will flash until the system temperature reaches the Setpoint. Once the Setpoint is reached the Red LED flashes with a short audible beep to let the operator/user know the next therapy cycle has started.

TROUBLESHOOTING

Problem	Possible Cause	Remedy
T/Pump will not turn on.	The electrical cord is not plugged into a properly grounded Hospital Grade receptacle.	Insert the plug fully into the properly grounded Hospital Grade receptacle.
T/Pump will not pump.	Water level is low or reservoir is empty.	Refill with room temperature water to proper level.
Flow indicator light is on.	Water flow to pad or hose is restricted. Clamp is closed. Water level is low or reservoir is empty. T/Pump is filled with water that is too hot.	Straighten the hose. Open the clamp. Refill with room temperature water to proper level. Refill with room temperature water to proper level.
Warning indicator & Audible alarm (Flash / Beep).	A High Heat (107°F / 42°C) or Cooling Setpoint was selected (50°F / 10°C). Loss of power while unit was in a Therapy mode. (Possible Power Fail.) Unit is running after a 20- or 30-minute "Off "therapy cycle period, has reached the desired Setpoint, and is now timing the 20- or 30- minute On cycle period. The unit just went into, or came out of Lock mode. Safety Circuit Function Test has started. Note: This would be followed with the unit starting, while still in Standby mode. See the Functional Check section on page 18 for details.	Indication only: A Setpoint outside body temperature range is selected. Insert the plug fully into the receptacle, place the unit into Standby mode, then unplug the T/Pump. If power is removed while unit is in On-Mode, the Power Fail alarm will beep for approximately 10 minutes. Indication only to indicate an "On" Therapy cycle period is timing. Indication only. Note: This should only be performed by medical service personnel. If this mode was started in error, press the On/Standby button to stop the test and go back to Standby mode with the pump off.

Problem	Possible Cause	Remedy
T/Pump running with the Standby light on.	Safety Circuit Function Test has started. Note: This would be followed with the unit starting, while still in Standby mode. See the Functional Check section on page 18 for details.	Important: This should only be performed by medical service personnel. If this mode was started in error, press the On/Standby button to stop the test and go back to Standby mode with the pump off.
Warning indicator on with unit in Standby mode.	Unit shut down in an over temperature condition. Safety Circuit Function Test completed successfully.	Empty the reservoir and refill with room temperature water. Make sure all clamps are open. Press the On/Standby button. Verify flow through the pad. The Warning light will turn off within 5 minutes. Allow the system to cool for 60 minutes or until the Warning light turns off.
Flow indicator and Standby indicator are on with T/Pump not pumping.	Unit detected a Flow warning for more than 5 minutes, thus goes to standby.	Reference "Flow indicator light is on" above. Correct the problem, and press the On/Standby to put the unit back into Run mode.
Temperature Setpoint light blinking.	Unit is warming up to the selected setpoint. Unit is in Cooling mode, for longer than 40 minutes.	Indication only. Follow the shutdown procedure. Drain the water in reservoir to ice fill level, and refill with ice. Follow the start-up procedure.

Problem	Possible Cause	Remedy
Both the Temperature and Therapy Cycle Setpoint lights are blinking.	Unit is in "Off" Therapy cycle time.	Indication only.
T/Pump will not heat.	Reservoir is empty. Flow is blocked.	Refill with room temperature water to proper level. Reference "Flow indicator light is on" above.
T/Pump will not cool.	Reservoir is empty. Flow is blocked. Ice is depleted.	Refill with room temperature water to proper level. Reference "Flow indicator light is on" above. Drain excess water to Cooling water line and fill remainder of reservoir with ice.
Temperature or Therapy Time buttons do not work.	The buttons have been locked.	Press and hold the lock button for two seconds.
Water leaks from hose connectors.	Damaged O-ring. Locking ring on Clik–Tite® connector is not snapped into place (See Figure 4 on page 9.)	Replace Clik–Tite® connector. Snap Clik–Tite® connector shut.

STORAGE / CLEANING

Storage (Short term) Less than 1 day

1. Close the hose clamps.
2. Disconnect the pad.
3. Connect ends of the connector hoses together, where applicable.
4. Open the hose clamps.
5. Leave water in the reservoir.
6. Coil and fasten the hose using the tube set strap and wrap the power cord around the unit.

Storage (Long term)

1. Drain the pump. (See instructions below.)
2. Coil the hose, rather than folding it, to prevent hose kinks.
3. Fasten the hose using the tube set strap and wrap the power cord around the unit.

Draining

1. Disconnect the T/Pump from AC power.
2. Clamp the hose clamps.
3. Disconnect the pad or hoses from one another, keeping hoses at or above the level of the T/Pump.
4. Open the hose clamps.
5. Remove the fill cap and invert the T/Pump over a sink.
6. When all fluid has drained from the hoses and reservoir, replace the fill cap.
7. Connect the hoses together, where applicable.

Institutional (Hospital) Cleaning Instructions

Note: Clean and change the water monthly or more often depending on use.

Clean the outer surfaces of the T/Pump with one of the following:

- A damp cloth and soapy water.
- A spray cleaner such as Fantastik
- A mild abrasive cleanser without bleach.

1. Prepare a germicidal solution according to the manufacturer's instructions. Use AirKem A-33, available from Ecolabs, Inc., 370 Wabasha, St. Paul, MN 35102 (phone: 1 800 247-5362), or from GAYMAR, product catalog MTA33.
2. Drain the pump.
3. Connect hose set together.
4. Fill the reservoir to the Heating water line on the back of the reservoir.
5. Select the 95°F (35°C) temperature setpoint on the keypad.
6. Start the T/Pump, and circulate the solution for one hour.
7. Drain the solution and refill the pump with clean water.

NOTE: In a home environment, perform only step 2 and the refill instructions in step 7.

Pads / Accessories

Only use Mul•T•Pads®. The unique button design allows optimal water flow and provides trouble-free operation when the pad is folded. This reduces the number of different sizes of pads your facility must keep in inventory.

The Mul•T•Pads with Clik-Tite® connectors can be interconnected to provide therapy to more than one body site at a time (Figure 1B, page 4). Refer to Catalog Descriptions on page 5 for a list of various pads and ordering information.

PREVENTIVE MAINTENANCE / SERVICE

⚠ DANGER

Risk of electric shock. Disconnect power before servicing.

⚠ WARNING

Only qualified medical service personnel should repair the T/Pump in accordance with the Service Manual. Improper repair mayresultindeathorseriousinjury,equipmentdamage,ormalfunction.

Refer to functional check. To obtain a copy of the Service Manual, contact your local dealder or Gaymar's International Department or visit our web site www.gaymar.com.

FUNCTIONAL CHECK

Operating Temperatures & Over-Temperature Safety Circuit Check

This section provides a check of the T/Pump's temperature control, and over-temperature safety circuit. Follow the steps in this section carefully, paying particular attention to each step, and its expected result. If at any time the expected result can not be verified, press the On/Standby button to stop the test, then restart the procedure. If after a second attempt the expected result can not be verified, press the On/Standby button to stop the test, then unplug the T/Pump and call your dealer or Gaymar's Technical Service Department for assistance.

⚠ WARNING

- Only qualified service personnel should perform this Functional Check. Improperly following the test procedure may result in equipment damage.
- Do not perform this Functional Check with an empty reservoir. Damage to the T/Pump may result.
- Read through and understand each step before performing the test.

Interval

To assure optimum performace, dependability and safety, the following Functional Check should be performed once per year (or as specified in the facility's preventive maintenance program).

Required Tools

- TFC1 or equivalent (Thermometer with 30°F to 125°F (-2°C to 52°C) range with 2°F (1°C) accuracy.
- TPT9 is used to measure the temperature and the flow of the water entering the pad.
- Stop Watch for testing Over-Temperature Safety Circuit
- Mul•T•Pad

Note: To order a TFC1, TPT9, and Mul•T•Pad, contact your dealer or Gaymar's International Department.

Test Setup

Connect the T/Pump to the TPT9 and Mul•T•Pad as shown in Figure 6.

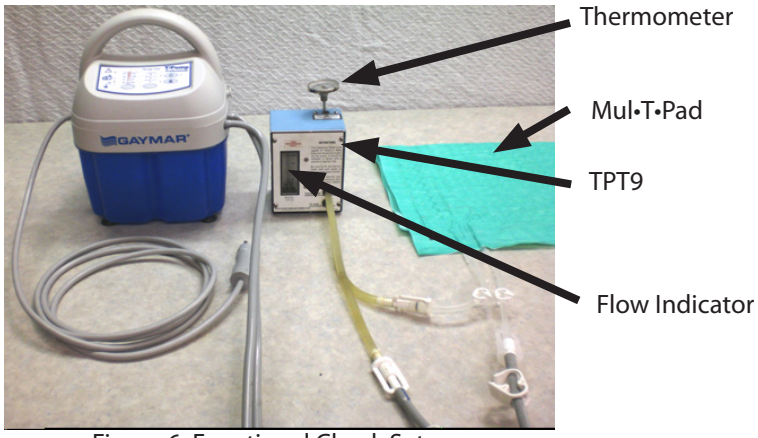


Figure 6: Functional Check Setup

Test Procedure

Note: Stay present for the full duration of the test to observe all readings and to prevent damage to the T/Pump.

1. Attach a pad to the connector hose (See Figure 6 on page 18). Then, unkink the pad and hose. Open the hose clamps.
2. Open the fill cap on top of the pump.
3. Fill with room temperature water to the Heating water line.
4. Plug the T/Pump into a properly grounded Hospital Grade receptacle.
5. Press the On/Standby button.

   The T/Pump performs its self test of the lights and audible alarm, with light pattern and short audible beep.

   The T/Pump goes to Standby mode with only the Standby light on.
6. Press and hold the Temperature Setpoint button.
7. While still holding the Temperature Setpoint button, press the On/Standby button. Hold both buttons simultaneously for 3 seconds and then release.

   The T/Pump gives a long audible beep, and the Warning light flashes.

   The T/Pump goes into Operating Temperature Function Test mode, and the:

   - T/Pump starts pumping with the Standby light on with a flow of 9 GPH minimum.
   - 107°F (42°C) setting is selected.
   - Continuous light is on.
   - System disables the Wave feature to maintain a steady 107°F supply of water to the pad.

   The T/Pump controls to 107°F (42°C) at the inlet to the pad for 15 minutes, the duration of the test.
8. After 12 minutes, verify with the TPT9 that the Temperature is at 107°F +/- 2°F (42°C+/-1°C) and flow is 9 GPH minimum.

   Note: If the T/Pump does not reach the temperature and flow, press the On/Standby button, unplug the unit, check the pad and hoses for kinks and start over.
9. After 15 minutes, observe that the T/Pump starts the Over Temperature Safety Circuit Test.

   The T/Pump gives a long beep with the Warning light on. This signals the start of the Over Temperature Safety Circuit Test.

Note: If at any time the Function test needs to be stopped, press the On/Standby button.

Note: If the system does not shut down in an over temperature condition in 30 seconds, press the On/Standby button, then unplug the T/Pump. Contact your dealer or Gaymar's Technical Service Department for assistance

Telephone: 716 662-2551

10. Start the stop watch to make sure the Over Temperature condition is detected in 30 seconds.

    WARNING: If this step is not followed, damage to the T/Pump may result.

    - The T/Pump gives a long beep and flash of the Warning light.
    - The pump stops. No water will be flowing to the pad.
    - The Heater is turned on at 100% power with no flow.
    - The 107°F (42°C) Setpoint light starts flashing.
    - The 20-minute Cycle light starts flashing.
    - When the T/Pump detects an Over Temperature Condition (temperature trip point of 115°F ±5°F [46°C ±2°C]), the T/Pump gives an audible beep and flashes the Warning light. The system then cycles and goes into Standby mode with the Warning light on.

11. When the Warning light turns on, stop the Stop-Watch.

12. Restart the Stop-Watch to make sure the T/Pump cools down to a point where the thermostat resets and the Warning light turns off in 60 minutes.

    Or, to speed up the cool down go to step 13.

13. To speed up the cool down:

    a. Unplug the T/Pump.

    b. Refill the reservoir with room temperature tap water.

    c. Restart the unit in Cooling mode.

    The system starts cooling down in Standby mode. The thermostat resets within 5 minutes.

    The test is completed.

14. Shut down the T/Pump as described on page 10.

SPECIFICATIONS

	TP702
Classification	Class I equipment with Type BF applied part suitable for continuous operation. Not classified for protection against ingress of liquid. Not classified for use in the presence of flammable anesthetics.
Size (approx.)	11.5" x 8" x 8" 29.2cm x 20.3cm x 20.3cm
Weight	6.5 lbs (2.9 kg) when empty 9 lbs (4.0 kg) with unit filled with water to heating level
Reservoir capacity	93 oz (2.75 l) maximum
Flow rate	9 gph (34 lph) minimum with pad attached
Ambient operating temperature	60°F to 90°F (15.6°C to 32.2°C)
Environmental conditions for transport and storage	-20°F to 120°F (-28°C to 48°C) At uncontrolled RH
Temperature setpoints	TP702 Professional 107°F (42°C) 100°F (38°C) 95°F (35°C) 50°F (10°C)
Average temperature accuracy	±2°F at 107°F (±1°C at 42°C)
Maximum Contact Surface Temperature	107°F (42°C)
High Limit Safety Temperature	111°F to 118°F (44°C to 48°C)
Power cord	Modular: adaptable to Country of use
Current leakage	100 microamperes maximum
Ground resistance	0.5 ohm max
Electrical requirements Voltage (VAC) Frequency (Hz) Current (amps)	 230±10% 50 Hz 2.0 amperes
Certifications	MEDICAL ELECTRICAL EQUIPMENT WITH RESPECT TO ELECTRICAL SHOCK, FIRE, AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH UL 60601-1 AND ASTM F 2196-2002 CLASSIFIED UL 8C08 IEC 60601-1-2

WARRANTIES

GAYMAR equipment and products are warranted against defects in material and workmanship under normal use, and operation from the date of purchase, for the time periods listed below for the respective equipment and products. Except for such warranty, GAYMAR disclaims all other expressed and/or implied warranties including, but not limited to, the implied warranties of merchantability and of fitness for a particular purpose.

PUMP

All labor performed and parts provided free of charge for a period of one (1) full year from the date of purchase, provided the equipment is returned with prior authorization prepaid to GAYMAR Industries.

PAD, SINGLE PATIENT USE

Free replacement of product where defects in materials and/or workmanship are evident at time of delivery, provided the product is returned with prior authorization prepaid to GAYMAR Industries.

PAD, REUSABLE

Free replacement of product where defects in materials and/or workmanship occur within 90 days from date of delivery, provided the product is returned with prior authorization prepaid to GAYMAR Industries.

PARTS

Defective parts will be exchanged free of charge where defects in materials and/or workmanship occur within 90 days from date of delivery, provided the parts are returned with prior authorization prepaid to GAYMAR Industries.

ENGLISH

The TP702 complies with EN60601-1-2: 2001 Second Edition

(CISPR Classified as Class B, Group 1 ISM equipment)

Medical Electrical Equipment needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided in the following pages.

Portable and mobile RF communications equipment can effect Medical Electrical Equipment.

CAUTION !

The TP702 should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the TP702 should be observed to verify normal operation in the configuration in which it will be used.

EMC INFORMATION

Guidance and manufacturer's declaration – electromagnetic immunity

The TP702 is suitable for use in the electromagnetic environment specified below.

The customer or the user of the TP702 should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment guidance
Electrostatic Discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	±6 kV contact ±8 kV air	Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast Transient/burst IEC61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	±2 kV for power supply lines ±1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality is that of a typical commercial and/or hospital environment
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5%Ut(95% dipUt) for 0,5 cycle 40%Ut (60% dop in Ut) for 5 cycles 70% Ut (30% dip in Ut) for 25 cycles <5% Ut (>95% dip in Ut) for 5 sec.	<5%Ut(95% dipUt) for 0,5 cycle 40%Ut (60% dop in Ut)for 5 cycles 70% Ut (30% dip in Ut) for 25 cycles <5% Ut (>95% dip in Ut) for 5 sec.	Mains power quality should be that of a typical commercial or hospital environment. If the user of the TP702 requires continued operation during power mains interruptions, it is recommended that the device be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial and/or hospital environment.
Note: U_T is the a.c. mains voltage prior to application of the test level.			

Recommended separation distances between portable and mobile RF communications equipment and the TP702.

The TP702 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the TP702 can help prevent electromagnetic interferences by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the TP702 as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter		
	150 kHz to 80 MHz $d = 1,2 \sqrt{P}$	80 MHz to 800 MHz $d = 1,2 \sqrt{P}$	800 MHz to 2,5 GHz $d = 2,3 \sqrt{P}$
0,01	0,12	0,12	0,23
0,1	0,38	0,38	0,73
1	1,2	1,2	2,3
10	3,8	3,8	7,3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer. NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies. NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

TP702 EMC Information

The TP702 is suitable for use in the electromagnetic environment specified below.

The customer or the user of the TP702 should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the TP702 including cables, than the recommended separation distance calculated from the equation appropriate for the frequency of the transmitter. Recommended Separation Distance $d = 1,2\sqrt{P}$ $d = 1,2\sqrt{P}$ 80 MHz to 800 MHz $d = 2,3\sqrt{P}$ 800 MHz to 2,5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, [a] Should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol:
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2,5 GHz	3 V/m	

NOTE 1 At 80 MHz and 800 Mhz, the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radiobroadcast, and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the TP702 is used exceeds the applicable RF compliance level above, the TP702 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the TP702.

[b] Over the frequency range 150 kHz to 80 MHz, field strengths are less than 3 V/m

Guidance and manufacturer's declaration – electromagnetic emissions

The TP702 is intended for use in the electromagnetic environment specified below.

The customer or the user of the TP702 should assure that it is used in such an environment

Emissions Test	Compliance	Electromagnetic Environment
RF emissions CISPR 11	Group 1	The TP702 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The TP702 is suitable for use in all establishments, including domestic establishments and those directly connected to the public low voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/Flicker emissions IEC 61000-3-3	Complies	

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